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Byron Wall. (Toronto: Wall & Emerson, 2003. x + 500 p., ill., fig.,
maps, index, bibl. ISBN 0-921332-52-1 \$39.95)

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Book Reviews / Recension des livres

General / Général

***Glimpses of Reality: Episodes in the History of Science.* By Byron Wall.** (Toronto: Wall & Emerson, 2003. x + 500 p., ill., fig., maps, index, bibl. ISBN 0-921332-52-1 \$39.95)

There is a certain historical irony in calling a book about the history of science “glimpses of reality” since a significant portion of the debates in science have been over what is real. Arguments over the actual reality of prime matter, crystalline spheres, phlogiston, atoms, the ether and the Big Bang come instantly to mind, but on a more philosophical and subtle level we could just as easily include struggles over philosophy and method, since what different scholars claim to be real is intimately connected to how they approach the study of the world.

Although Byron Wall does make some note of the competing ideas about reality, discussing, for example, the difference between Aristotle and Plato’s philosophies (p. 80-82), and in the modern section briefly introducing positivism (p. 316-317), the book’s real focus is on the episodes. Since the book is intended to be used as a textbook for a survey course on the history of science, the format makes the material easily accessible to the student. The text is presented in four parts — I. Ancient Beginnings, II. Science Emerges, III. From Certainty to Uncertainty, IV. What is Life? — comprising 24 chapters, which are in turn broken down into many subtitled subsections. Each subsection is an episode, either an exposition of a significant idea, or recounting an important historical event. These take the reader from the ancient Greek *agora* to the edge of the modern day with the Human Genome Project. Herein lies the strength of Wall’s work. Each of the episodes is clearly written and presented in language that makes the often complex ideas understandable to a student with little or no background in the subject. The text is well illustrated, and there are many diagrams, charts and line drawing to elucidate the various points. For example, the chapter “Axioms and Proofs” devotes four pages (p. 106-109) to a Euclidean proof. In addition, there is liberal use of primary source material, such as a large excerpt from Galileo’s *Starry Messenger* (p. 192-198). If this presentation of material matches the pedagogical approach of an instructor, *Glimpses of Reality* would be a reasonable textbook to choose.

The weakness of *Glimpses of Reality* is also its episodic nature. Wall acknowledges this in the Preface (p. ix) when he says:

This book is not comprehensive by any means. It is a selection of topics, all from the history of western science, and they are chosen as much as anything in order to make a coherent, connected story. Too often texts that survey the history of science try for completeness and end up being encyclopedias, valuable as reference works but mind numbing for those new to the subject matter.

The text does, in a sense, tell a connected story, but I am not sure that the story I found was what the author actually intends students to discover. The student is meant to learn that our modern understanding of the physical universe was due to the triumph of rationality as encapsulated in the work of a wide variety of important thinkers. Those thinkers, by resolving certain puzzles using a combination of logic, observation and, after its general introduction, experimentation, brought us ever closer to seeing reality. Even if a complete picture of reality might not be possible (see the section on uncertainty), it was (and is) our striving for it that makes science such a transcendent activity.

What historians may see in this book is a relentlessly internalist story about the rise of physics as the premier science (with its sidekick astronomy), with biology added to round out the textbook. More than half the book is directly devoted to physics and astronomy, except for Part IV "What is Life?" (112 p.), much of the remainder is given over to logic and mathematics presented as necessary first steps towards good astronomy and physics. While the author has every right to construct this historical argument, and it is both traditional and still powerful, it might have been better to drop the biology altogether and simply present a history of physics and astronomy. Instructors could then pair *Glimpses of Reality* with other texts such as Peter J. Bowler's *Evolution* (Berkeley: University of California Press, 1984) or Fathi Habashi's *From alchemy to atomic bombs*. (Quebec: Métallurgie extractive, 2002). The concentration on physics however, makes this book less desirable as a survey text. Entire fields are noted only in passing (geology gets about nine pages in the biology section, but nothing beyond Charles Lyell), while other fields go unmentioned. The most glaring is the absence of chemistry. There are no entries for Robert Boyle, John Dalton or Antoine Laurent Lavoisier. Despite their importance to both physics and chemistry, there is no mention of Amedeo Avogadro or Friedrich Wilhelm Ostwald. Wall discusses the discovery of deoxyribonucleic acid (DNA), but there is nothing on organic chemistry. Chronologically, there are apparently no episodes of scientific interest between Ptolemy and Nicolaus Copernicus.

Even within the text's concentration on physics there are some odd gaps. Although the section on physics ends with material about the Big Bang and theories of cosmology, the only mention of Stephen Hawking

(arguably the most famous living physicist and important to cosmological thought) is that he currently holds the same Lucasian professorship that Newton held. There is nothing about the Manhattan Project, so there are no entries for Enrico Fermi, Robert Oppenheimer, Leo Szilard, Lise Mietner or Otto Hahn, or anything to do with fusion or later fission. In general, little of the outside world intrudes on the episodes. Politics, war, religion, education, and the whole idea of science as a discipline are not discussed. For example, the Royal Society of London is mentioned only in passing with no historical comment, while the Academie des Sciences is never mentioned.

The problem of writing a textbook that is both engaging and broad enough to be useful without becoming a compendium of “one damned fact after another,” is a daunting task. I am not a disinterested party in this regard, since my own text has just appeared (with Lesley Cormack, *A History of Science in Society: From Philosophy to Utility*, Broadview Press, 2004).

Indeed, the sudden appearance of a number of survey texts speaks to the growth of the field of history of science. As the demand for history of science grows, the demand will also grow for good textbooks that use a variety of approaches. When instructors could teach small groups of students by working through primary sources, textbooks were of little use. Now it is increasingly common for historians of science to lecture to hundreds of students drawn from every faculty on campus, making introductory texts a necessity. While Wall’s text does avoid the problem of “encyclopedia-it is” (a charge frequently leveled against Stephen Mason’s *A History of the Sciences*, MacMillan, 1962, now out-of-print), it is perhaps too narrow in focus to stand alone as an introductory text.

That said, there is also another reason to applaud the appearance of survey texts, since there is nothing like kicking the cannon to get people thinking new ideas. Textbooks have always been the target for new scholars, as they attack the ossified ideas of the textbook writers, until in their maturity they pass on their ideas to the next generation in the form of new textbooks.

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